

TECHNICAL REVIEW DOCUMENT
For
MODIFICATION TO OPERATING PERMIT 95OPMR010

Colorado Interstate Gas Company – Ft. Morgan Compressor Station
Morgan County
Source ID 0870003

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Revised March and April 2007

Revised June 2007 to include administrative changes (remove ethylene glycol dehydrators and make corrections to permit language and monitoring for the triethylene glycol dehydrator and reboiler)

I. Purpose:

This document establishes the decisions made regarding the requested modifications to the Operating Permit for the Ft. Morgan Compressor Station. This document provides information describing the type of modification and the changes made to the permit as requested by the source and the changes made due to the Division's analysis. This document is designed for reference during review of the proposed permit by EPA and for future reference by the Division to aid in any additional permit modifications at this facility. The conclusions made in this report are based on the information provided in the original requests for modifications submitted to the Division on November 27, 2006, additional information submitted on December 12, 2006, March 14, April 20 and June 6, 2007, various e-mail correspondence and telephone conversations with the source. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised construction permit.

II. Description of Permit Modification Request/Modification Type

The renewal operating permit for the Ft. Morgan Compressor Station was issued on July 1, 2006. The source submitted two requests for modification on November 27, 2006. In the first request, the source indicated that such request qualified as a minor modification as defined in Colorado Regulation No. 3, Part C, Section X and the source

requested that the permit modification be processed using those procedures. The minor modification request was to revise two of the “worst case” parameter values for the triethylene glycol (TEG) dehydrator. With the revision to these parameters, the source is requesting an increase in NO_x, CO and VOC emissions from the unit. The increase in emissions from previously permitted levels are below the PSD significance levels (as shown in the below table); however, the requested VOC emissions from the dehydrator are above the PSD significance level.

	NO _x	CO	VOC
Requested Emissions for TEG Unit	4.73	25.73	40.91
Current Permitted Emissions for TEG Unit	2.4	13.3	24.9
Change in Emissions	2.33	12.43	16.01

As part of this modification, the source has submitted a netting analysis to show that considering the contemporaneous increases and decreases at the facility VOC emissions from the glycol dehydrator are below the significance level. Therefore, since the net emissions increase is not significant PSD review does not apply. The netting analysis is discussed in further detail in Section IV of this document.

Colorado Regulation No. 3, Part C, Section X.A identifies those modifications that can be processed under the minor permit modification procedures. Specifically, minor permit modifications “are not otherwise required by the Division to be processed as a significant modification” (Colorado Regulation No. 3, Part C, Section X.A.6). The Division requires that “any change that causes a significant increase in emissions” be processed as a significant modification (Colorado Regulation No. 3, Part C, Section I.A.7.a). Since the change in permitted emissions associated with the requested minor modification are less than the PSD significance levels, the Division agrees that the change to the “worst case” TEG parameter values and subsequent emissions increase associated with that change meet the definition of a minor modification and can be processed as a minor modification. Note that as discussed above, the source did demonstrate that the “net emission increase” from the TEG unit is below the PSD significance level for VOC emissions and the details of this analysis are included in Section IV of this document.

The other modification submitted on November 27, 2006, requests the removal of the supplemental fuel requirement for the flare on the TEG unit. In their application, the source demonstrated that supplemental fuel is not necessary to bring the heat content of the gases sent to the flare (TEG unit regenerator overheads and flash tank off-gas) to 200 Btu/scf. The Division requires that “every significant change in existing monitoring permit terms or conditions” and “every relaxation of reporting or record keeping permit terms or conditions” be processed as a significant modification (Colorado Regulation No. 3, Part C, Sections I.A.7.f and g). The Division considers that the removal of the supplement fuel requirement is a significant change in an existing monitoring and a relaxation of recordkeeping requirements. Therefore the Division agrees that the

modification to remove the supplemental fuel requirement for the flare on the TEG unit must be processed as a significant modification.

The potential to emit of the facility following the requested modifications and startup of the TEG unit is as follows:

Emission Unit	Potential to Emit (tons/yr)			
	NO _x	CO	VOC	HAPS
E001/CG-1 – Engine	66	109.5	0.64	1.11
E002/CG-2 – Engine	66	109.5	0.64	1.11
E003/CG-7 – Engine	111.5	15.2	3.2	1.38
E004/CG-8 – Engine	122.7	16.7	3.5	1.52
E005/CG-9 Engine	122.7	16.7	3.5	1.52
E006 & #007/CG-10 & CG-11 – Two (2) Engines	34.0	51.0	13.0	4.24
New dehydrator/flare ¹	4.73	25.73	40.91	9.37
New dehydrator reboiler	2.8	4.6	0.2	0.05
S010 - Fugitive VOC Emissions from Equipment Leaks			0.6	0.02
E008/CG-12 – Engine	22.2	26.7	7.4	1.40
Well Head Heaters (various sizes, combined heat input 15 mmBtu/hr) ²				0.12
Emergency Generator ²				0.02
Total	552.63	375.63	73.59	21.86

¹the existing EG units must be removed and/or rendered inoperable upon startup of the new dehydrator. HAP emissions from the dehydrator shown in this table are based on the provisions in 40 CFR Part 63 Subpart HHH § 63.1270(a)(1). VOC emissions are as requested on the APEN and based on 8760 hrs/yr of operation.

²Insignificant activities were included in the source's analysis, to appropriately assess HAP emissions for the facility.

Note that the breakdown of HAP emissions by emission unit and individual HAP is provided on page 10 of this document.

III. Modeling

The requested modification will result in slight increases in permitted NO_x, CO and VOC emissions of 2.33, 12.33 and 16.01 tpy, respectively. The increase in NO_x and CO emissions are well below the modeling thresholds of 40 tpy and 100 tpy, as specified in the Division's modeling guidance; therefore, modeling is not required. In addition, modeling for VOC emissions is not required.

IV. Discussion of Modifications Made

Source Requested Modifications

The Division addressed the source's requested modifications as follows:

Minor Modification Request - Revise "worst case" parameters for TEG unit and increase permitted emissions

The primary purpose of the modification was to revise some of the "worst case" parameters included in the GLYCalc analysis used to set the permit limits. In revising these parameters, VOC emissions from the dehydrator increase, as well as NO_x and CO emissions since more gases are processed by the flare. The source has requested VOC emissions above the PSD significance level and because this facility is a major stationary source for purposes of PSD review, PSD review applies if the "net emissions increase" from the project exceeds the PSD significance level. The source has chosen to consider other increases and decreases over the contemporaneous period in order to "net-out" of PSD review.

In order to "net-out" of PSD review, the source must include all contemporaneous increases and decreases in actual emissions in order to determine the "net emissions increase". Colorado Regulation No. 3 was revised recently to reflect revisions that were made to the federal PSD rules in 2002. Although the definition of contemporaneous was not changed with the 2002 PSD rule revisions, the Division revised the definition of contemporaneous in Reg 3 (Reg 3, Part D, Section II.A.26.b) to indicate that increases or decreases are contemporaneous "with the increase from the particular change only if it occurs *within five years prior to the date that the increase from the particular change occurs.*" It should also be noted that the definition includes italicized text, which is not in effect until EPA approves the revisions to Regulation No. 3 to include the 2002 PSD revisions. In this case, the specified time is in italicized text, leaving no effective definition of contemporaneous; although Section II.A.26.c, defines creditable increases and decreases and specifies that to be creditable the increases and/or decreases must occur within five years before the date that the increase or decrease occurs (Reg 3, Part D, Section II.A.26.c.(i)). Note that this language was added with the Reg 3 revisions to address the 2002 PSD rule revisions. Under this definition, the contemporaneous period would be the five years prior to startup of the TEG unit. Startup was originally projected to be November 1, 2006; however, startup has been delayed. In their April 20, 2007 submittal, CIG indicated that the TEG unit would start-up on April 25, 2007. Therefore, based on the new projected startup date of April 25, 2007 for the TEG unit, the contemporaneous period is from April 25, 2002 through April 25, 2007.

Although the substantive portion of the current Reg 3 definition of contemporaneous is in italics and therefore presumably not in effect, under the provisions for creditable, the time frame of five years prior to the change is defined.

In their revised netting analysis (submitted via e-mail on December 12, 2006), the source demonstrated that when contemporaneous increases and decreases are considered that the net emission increase from the project (TEG unit) is below the significance level and that PSD review does not apply. The table below provides a summary of the creditable increases and decreases in actual emissions over the contemporaneous period (April 25, 2002 through April 25, 2007):

Change	Date Change Occurred	VOC Emissions (tons/yr) ¹		
		Actual Emissions 8/1/04 – 7/31/05	Actual Emissions 8/1/05 – 7/31/06	Average Actual Emissions
Increases				
Addition of Engine E008	8/19/03	1.959	2.266	2.1125
Decreases				
Removal of EG Units ²	Prior to startup of TEG Unit	3.787	6.558	5.1725

¹Actual emissions based on information submitted in the December 12, 2006 submittal. As provided for in Colorado Regulation No. 3, Part D, Section II.A.26.c.(ii) the source provided credible, demonstrable evidence of what actual emissions were after making the increase/decrease in lieu of submitting APENs.

²Note that the removal of the EG units was made federally enforceable in the July 1, 2006 permit modification to add the TEG unit (Section II, Condition 6.2).

Note that although the source took limits on the hours of operation for engines E003 through E005 (reduced from 8760 hrs/yr to 7008 hrs/yr) in the July 1, 2006 revised Title V permit, those reductions are not considered creditable because actual hours of operation for these engines are below the permitted level of 7,008 hrs/yr.

Based on the creditable increases and decreases in actual emissions over the contemporaneous period, the “net” emission increase from the project is shown in the following table:

	VOC Emissions (tons/yr)
Requested Emissions for new TEG Unit	40.91
Requested Emissions for TEG Unit Reboiler	0.16
Creditable Decreases	-5.17
Creditable Increases	2.11
“Net” Emission Increase	38.01
PSD Significance Level	40

As part of this modification, the Division made the following revisions as requested in the application.

Section II, Condition 6.5: Revised the VOC emissions as requested in the table and text. This includes changing the comparison criteria for inlet gas temperature and stripping gas rate in the table in Condition 6.5.1 as requested. This also includes changing the VOC lbs/hr used to calculate emissions in Condition 6.5.5 to reflect the

latest “worst case” GLYCalc run. Note that the CAM Plan (Appendix G) of the permit was also revised to reflect the requested VOC emission limitations.

Section II, Condition 6.4: Revised the NO_x and CO emissions as requested in both the table and text. Although not specifically addressed in the proposed permit submitted with the minor modification application, the Division revised the method to calculate emissions. In the previous analysis, the supplemental fuel was used to bring the Btu content of the gas sent to the flare to 200 Btu/scf. With the change in some of the GLYCalc parameters, the Btu content of the gas sent to the flare is over 200 Btu/scf based on the “worst case” GLYCalc run (by calculation this value is 552.1 Btu/scf), although the heat value is slightly higher when the 200 scf/hr supplemental fuel is included (by calculation this value is 554.8 Btu/scf). Therefore, the Division has replaced the 200 Btu/scf value in the equation in Condition 6.4 with 552.1 Btu/scf (based on no supplemental fuel). Note that as discussed below under Condition 6.8, the revisions to the calculation method are based on no supplemental fuel since the minor and significant modifications are being processed concurrently. Because the source can operate under the minor modification prior to permit issuance, the source must use 554.8 Btu/scf in the emission calculations in Condition 6.4 in lieu of the 200 Btu/scf specified in the current permit if they choose to operate under the requested changes addressed in the minor modification.

Section II, Condition 6.8: Revised the quantity of supplemental fuel as requested in both the table and text. It should be noted that the source requested removal of the supplemental fuel requirement in their significant modification and the Division is processing these modifications concurrently. Therefore, the draft permit does not include any supplemental fuel requirement. However, because the source can operate under a minor modification prior to permit issuance, the source must meet the 200 scf/hr supplemental fuel limitation proposed in the minor modification application in lieu of the currently permitted supplemental fuel requirement of 2,340 scf/hr if they choose to operate under the requested changes addressed in the minor modification.

Section II, Condition 6.9: Revised the permitted quantity of gas consumed by the flare in the table and text. This includes revising the method to determine the quantity of fuel consumed by the flare in Condition 6.9.2, based on the hourly gas generation rate for the regenerator and flash tank as predicted by the revised GLYCalc run submitted with the November 27, 2006 application.

Section II, Condition 4.1: The source requested that the comparison criteria for the cold separator temperature be corrected to indicate “at or above”.

Section II, Condition 2.1: The source noted a typographical error regarding the NO_x emission factor in Condition 2.1 (the table) in a November 27, 2006 e-mail. The Division has corrected the error with this modification.

Significant Modification Request – Remove supplemental fuel requirement for TEG unit flare

In their significant modification request, the source requested that the requirement to use supplemental fuel for the flare be removed. In the significant modification application, the source demonstrated that according to the new "worst case" GLYCalc run that supplemental fuel was not required because the Btu content of the gas sent to the flare was over 200 Btu/scf. Since the TEG unit may not always be operating at these "worst case" values, in their significant modification application, the source looked at other potential operating scenarios which would result in lower VOC emissions and consequently a lower Btu content of the gases sent to the flare. Both of these alternate scenarios demonstrated that the Btu content of the gases sent to the flare would be above 200 Btu/scf. Therefore, the Division agrees that supplemental fuel is not required and will remove the supplemental fuel requirement (Condition 6.8). In addition, Condition 6.9.1 was removed and references to supplemental fuel were removed from Condition 6.9.

March 14, 2007 Modification Request

A letter was submitted on March 14, 2007 requesting additional changes to the Ft. Morgan Title V permit. The source did not identify these modification as minor modifications and did not request that they be processed as minor modifications; therefore, the Division will consider these changes to be significant modifications. As such these changes cannot be implemented until the permit has been issued.

Section II. Condition 5.7

The source requested that the formaldehyde emission factor be revised from 1.42×10^{-2} lb/mmBtu to 1.89×10^{-2} lb/mmBtu. The Division has made the change as requested. However, it should be noted that at the permitted fuel consumption limit, based on a natural gas heat content of 950 Btu/scf, the formaldehyde emission limit would be exceeded (0.75 tons/yr vs permitted 0.53 tons/yr). The source submitted an APEN on April 20, 2007 requesting that the formaldehyde emissions be increased to 0.75 tons/yr.

Section II, Conditions 2.6, 3.4 and 5.3

The source requested that language specifying how the Btu content of the natural gas is to be determined be revised. The source has requested that only two specific months of data from the in-line gas chromatograph be used to determine the Btu content, rather than the 6-month periods specified in the permit. The Division has revised the language as requested with a minor revision to clarify some language.

Other Modifications

In addition to the requested modifications made by the source, the Division used this opportunity to include changes to make the permit more consistent with recently issued permits, include comments made by EPA on other Operating Permits, as well as correct

errors or omissions identified during inspections and/or discrepancies identified during review of this modification.

The Division has made the following revisions, based on recent internal permit processing decisions and EPA comments on other permits, to the Ft. Morgan Operating Permit with the source's requested modifications.

Section I – General Activities and Summary

- Revised the citations in Condition 3 to reflect recent revisions to Colorado Regulation No. 3.

Section II.4 – EG Units

- Condition 4.4 of the permit requires the source to comply with the NGTS MACT for these two units by August 13, 2006. When the permit was revised July 1, 2006, it was not clear if the new TEG unit would commence operation prior to the MACT compliance date for the EG units. Since startup of the TEG units has been delayed the EG units are still in operation and therefore subject to the MACT. The source submitted information on September 13, 2006 indicating that since actual benzene emissions from these units are below 1 tpy, they are exempt from the control, monitoring, recordkeeping and reporting requirements of the MACT as provided for in 40 CFR Part 63 Subpart HHH § 63.1274(d)(2). However, the procedures specified in § 63.1282(a)(2) must be used to determine actual emissions and records of such determinations must be maintained as required by § 63.1284(d). The Division has revised Condition 4.4 to include these requirements.

The source submitted a notice on June 6, 2007 indicating that the EG units have been rendered inoperable and requesting cancellation of the underlying construction permits for these units. Therefore, the permit conditions for the EG units were removed from the permit prior to issuance.

Section II.5 – Engine E008

- Removed the requirement to conduct a performance test (Condition 5.7.2) for formaldehyde emissions, since the test has been completed.

Section II.6 – TEG Unit

- Corrected typographical errors in Condition 6.10. In the table (under "limitations" column) removed "of each unit" and in the text replaced "engine" with "glycol dehydrator".
- Revised the language in Condition 6.5.3 to specify that a GLYCalc run is not required if the dehydrator is operated for less than 10 days in a month.

- Removed Conditions 6.1 (commence construction), 6.2 (removal of EG units), and 6.3 (startup notification) since the unit began operation in May 2007 and the request to cancel the permits for the EG units was submitted on June 6, 2007, these requirements have been fulfilled and do not need to be in the permit.

Section II.7 –Reboiler

- The language in the table (Condition 7.8), under the “limitations” column was corrected to read “not to exceed 20%”.
- Corrected the equation and permit language for calculating emissions (Condition 7.1). The permit includes emission factors in units of lb/mmBtu but the equation and permit language are written for emission factors in units of lb/mmSCF.
- Included a requirement in the permit to determine the Btu content of the gas burned in the reboiler. Since emission factors are in units of lb/mmBtu, the heat content of the natural gas is necessary to calculate emissions.
- Revised the language in Condition 7.2 to require that fuel consumption be calculated based on hours of operation, design rate and the Btu content of the gas.
- Removed Conditions 7.3 (commence construction) and 7.4 (startup notification), since this unit commenced operation in May 2007, these requirements have been fulfilled and do not need to be in the permit.

Section IV – General Conditions

- The upset revisions in the Common Provisions Regulation (general condition 3.d) were revised December 15, 2006 (effective March 7, 2007) and the revisions were included in the permit. Note that these provisions are state-only enforceable until approved by EPA into Colorado’s state implementation plan (SIP).
- Replaced the reference to “upset” in Condition 5 (emergency provisions) and 21 (prompt deviation reporting) with “malfunction”.
- Replace the phrase “enhanced monitoring” with “compliance assurance monitoring” in Condition 22.d.

Appendices

- Appendices B and C were replaced with the latest versions.
- Appendix D was revised to indicate EPA’s new mailing address.

HAPS per Source Analysis - after Mod and startup of TEG Unit

Note that more HAPS were included in the source's November 27, 2006 submittal, the table below lists the more significant HAPS

Unit	HAP Emissions (tons/yr)									total
	acetaldehyde	acrolein	benzene	toluene	ethyl benzene	xylene	formaldehyde	n-hexane	methanol	
E001	1.03E-01	6.31E-02	1.81E-01	5.78E-02	1.40E-03	1.63E-02	5.76E-01		1.16E-01	1.11E-00
E002	1.03E-01	6.31E-02	1.81E-01	5.78E-02	1.40E-03	1.63E-02	5.76E-01		1.16E-01	1.11E-00
E003*	3.86E-02	5.72E-02	1.60E-03	2.80E-02	2.50E-03	9.80E-03	1.21E-00	4.00E-03	3.38E-02	1.38E-00
E004*	4.25E-02	6.29E-02	1.70E-03	3.08E-02	2.70E-03	1.08E-02	1.33E-00	4.00E-03	3.72E-02	1.52E-00
E005*	4.25E-02	6.29E-02	1.70E-03	3.08E-02	2.70E-03	1.08E-02	1.33E-00	4.00E-03	3.72E-02	1.52E-00
E006*	1.43E-01	1.50E-01	3.08E-02	2.58E-02	2.10E-03	9.30E-03	1.62E-00	2.35E-02	1.09E-01	2.12E-00
E007*	1.43E-01	1.50E-01	3.08E-02	2.58E-02	2.10E-03	9.30E-03	1.62E-00	2.35E-02	1.09E-01	2.12E-00
New Dehy			1.29E-00	4.40E-00	1.55E-00	2.08E-00		4.84E-02		9.37E-00
New Dehy Reboiler (6.3 mmBtu/hr)			5.68E-05	9.20E-05			2.03E-03	4.87E-02		5.09E-02
Emergency Generator (500 hp)**							1.60E-02			1.60E-02
Well Head Separators (various sizes, combined heat input 15 mmBtu/hr)			1.35E-04	2.19E-04			4.83E-03	1.16E-01		1.21E-01
Fugitive VOCs			2.97E-03	7.16E-03	2.10E-03	2.10E-03		4.19E-03		1.85E-02
E008	1.87E-01	1.97E-01	4.03E-02	3.38E-02	2.80E-03	1.21E-02	7.50E-01	3.08E-02	1.43E-01	1.40E-00
Total	8.00E-01	8.07E-01	1.76E-00	4.69E-00	1.57E-00	2.17E-00	9.02E-00	3.07E-01	7.02E-01	2.18E+01

*Engine limited to 7008 hrs/yr of operation.

**emergency generator is APEN exempt at 250 hrs/hr of operation (Reg 3, Part A, Section II.D.1.ttt.(ii)), emissions based on 250 hrs/yr of operation.

Engine emissions are based on GRI HAPCalc version 3.0 field test emission factors, if no field test factors then GRI literature or EPA factors for each pollutant except that for E003, E004 and E005 formaldehyde emission factor from July 2004 performance test and for E008 formaldehyde based on requested emissions

Dehy emissions from GLYCalc run @ 2634 hrs/yr (per 63.1270(a)(1))

Fugitive VOC emissions are based on latest component count, latest EPA emission factors, 8760 hrs/yr of operation and the HAPs from wet gas analysis for dehy run.

Emission factors for dehy reboiler and well head separators are based on design rate, AP-42 emission factors and 8760 hrs/yr of operation.